What is claimed:

1. A system for non-invasively monitoring the operation and performance of an implanted cerebrospinal shunting system, comprising an implanted controller; said controller further comprising:

   an inclination sensor;

   a pressure sensor;

   a wireless transceiver capable of communicating with an external programmer; and

   an embedded microprocessor, capable of reading said inclination sensor and said pressure sensor and transmitting, using said wireless transceiver, said readings from said sensors;

   and an external programmer with wireless capability, said programmer capable of wireless communication with said controller.

2. The system of claim 1, whereby said programmer can wirelessly transmit data and commands to said implanted controller, and whereby said controller can wirelessly transmit data and status responses to said programmer.

3. A method of determining, in an implanted controller system having a ventricular cannula in fluid communication with the cerebrospinal fluid in the brain of the patient, and a pressure sensor in fluid communication with said ventricular cannula and with an outlet cannula having a distal end, the cerebrospinal fluid flow resistance downstream from said pressure sensor, the method comprising the steps of:

i. Providing a known calibration constant;

ii. measuring with said pressure sensor, a pressure indicative of the initial intraventricular pressure of said patient in a supine position;

iii. occluding the flow of cerebrospinal fluid (CSF) from the brain for a predetermined period;

iv. measuring a plurality of occluded pressures over said predetermined period;

v. storing, said occluded pressure measurements;

vi. determining the difference between said initial pressure and the final pressure of the last of said plurality of occluded pressure measurements;

vii. determining the decay time from said initial pressure measurement until one of said occluded pressure measurements reached a value of said initial pressure less half the difference between said initial pressure reading and said final pressure reading;

viii. calculating the distal flow resistance, by multiplying said decay time by said calibration constant.

4. The method of claim 3, wherein said controller comprises an occluder located in the CSF flow path between the brain and the pressure sensor and positioned directly beneath the scalp, whereby said

occlusion of CSF is achieved by actuating said occluder.

5. The method of claim 3, whereby said occluded pressure measurements are transmitted wirelessly to external programmer before performing steps vi, vii and viii.

6. The method of claim 3, further comprising the step of calculating the supine cerebrospinal fluid flow rate, said flow rate defined as said initial pressure less said final pressure, divided by said distal resistance.

7. The method of claim 3, further comprising the measurement the cranial compliance of a patient with said implanted controller, where said controller comprises a multi mode drainage system in which a first mode is a low resistance passive substantially supine mode and a second mode is a variable pressure substantially upright mode, said measurement comprising the steps of:

   i. Sensing an initial upright pressure, where said patient is in an upright position;

   ii. changing said drainage mode of the implanted controller to permit the cerebrospinal fluid to flow through said low resistance flow path;

   iii. measuring a plurality of upright pressures over a predetermined amount of time;

   iv. storing said upright pressure measurements;

v. calculating the instantaneous flow rate corresponding to each said upright pressure measurements, said flow rate being equal to said upright pressure reading less said final pressure reading, divided by said distal flow resistance;

vi. calculating the total volume of CSF shunted by summing all said instantaneous flow rates and multiplying said summation by the sample time, where said sample time is defined as the time between each of said plurality of upright pressure measurements; and

vii. calculating the cranial compliance by dividing said volume by the difference between said initial upright pressure and said final pressure;

8. The method of claim 9, whereby said upright pressure readings are transmitted wirelessly to said external programmer prior to completing steps v, vi, and vii.

9. The method of claim 9, further comprising the step of calculating the proximal shunt resistance between the proximal tip of said ventricular cannula located in the ventricle of said patient and said implanted controller; said proximal shunt resistance given as said decay time, divided by the product of 0.7 and said cranial compliance, then reduced by said distal flow resistance.

10. A method of regularly monitoring cerebrospinal fluid shunt flow resistance in an implanted CSF

shunt system, where said shunt system comprises a multi mode drainage system, in which a first mode is a low resistance substantially supine flow path and a second mode is a variable upright mode, which further comprises a check valve with a programmable variable cracking pressure, comprising the steps of:

i. activating the implanted CSF controller at a prescribed time;

ii. monitoring an implanted inclination sensor in said controller to insure that the patient is in a supine position;

iii. measuring the initial pressure recorded by an implanted pressure sensor;

iv. changing said drainage mode of said implanted controller to permit the cerebrospinal fluid to flow through said programmable check valve, said change causing said pressure to increase;

v. monitoring said pressure sensor until the pressure reading exceeds said initial pressure by a predetermined amount;

vi. changing said drainage mode of said implanted controller to permit said cerebrospinal fluid to flow through said low resistance flow path; and

vii. measuring the elapsed time from said change to said low resistance flow path until said pressure sensor measures a pressure reading of said initial pressure plus one half of said amount.

11. The method of claim 10, wherein said prescribed time occurs during said patient's typical sleep period.
12. The method of claim 10, wherein said predetermined amount is in the range of 2-6 mm Hg.
13. The method of claim 10, wherein said elapsed time is stored in said controller's internal memory.
14. The method of claim 13, wherein said controller notifies said patient when said elapsed time changes significantly from said previously stored elapsed time.
15. The method of claim 14, wherein said controller notifies said patient by activating a piezo electric buzzer, located in said controller.
16. The method of claim 13, whereby said stored elapsed times can be transmitted wirelessly to an external controller.